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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/023,418	12/17/2001	Shuit-Tong Lee	12364.36US01	2298

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EXAMINER

VERSTEEG, STEVEN H

ART UNIT PAPER NUMBER

1753

DATE MAILED: 04/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/023,418	Applicant(s) LEE ET AL.	
	Examiner Steven H VerSteeg	Art Unit 1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 April 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,3-5 and 7 is/are allowed.
- 6) ☒ Claim(s) 2,6 and 8-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4. 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I, claims 1-12 in Paper No. 6 is acknowledged.

Irradiated Mail

2. The papers filed on June 21, 2002 (certificate of mailing dated June 21, 2002) have not been made part of the permanent records of the United States Patent and Trademark Office (Office) for this application (37 CFR 1.52(a)) because of damage from the United States Postal Service irradiation process. The above-identified papers, however, were not so damaged as to preclude the USPTO from making a legible copy of such papers. Therefore, the Office has made a copy of these papers, substituted them for the originals in the file, and stamped that copy:

COPY OF PAPERS ORIGINALLY FILED

3. If applicant wants to review the accuracy of the Office's copy of such papers, applicant may either inspect the application (37 CFR 1.14(d)) or may request a copy of the Office's records of such papers (*i.e.*, a copy of the copy made by the Office) from the Office of Public Records for the fee specified in 37 CFR 1.19(b)(4). Please do **not** call the Technology Center's Customer Service Center to inquiry about the completeness or accuracy of Office's copy of the above-identified papers, as the Technology Center's Customer Service Center will **not** be able to provide this service.
4. If applicant does not consider the Office's copy of such papers to be accurate, applicant must provide a copy of the above-identified papers (except for any U.S. or foreign patent

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documents submitted with the above-identified papers) with a statement that such copy is a complete and accurate copy of the originally submitted documents. If applicant provides such a copy of the above-identified papers and statement within **THREE MONTHS** of the mail date of this Office action, the Office will add the original mailroom date and use the copy provided by applicant as the permanent Office record of the above-identified papers in place of the copy made by the Office. Otherwise, the Office's copy will be used as the permanent Office record of the above-identified papers (*i.e.*, the Office will use the copy of the above-identified papers made by the Office for examination and all other purposes). This three-month period is not extendable.

Specification

5. The disclosure is objected to because of the following informalities: "plotof" should be "plot of" on page 5, line 1; and "form" should be "from" on page 6, line 8.

Appropriate correction is required.

Claim Objections

6. Claims 2 and 3 are objected to because of the following informalities: "any of" needs deleted in line 1 of claims 2 and 3; and "the group consisting of" needs inserted after "from" in line 1 of claim 2 to provide proper Markush terminology. Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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8. Claims 2, 6, and 10-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
9. Claim 2 recites the limitation "the sputter gas" in line 1. There is insufficient antecedent basis for this limitation in the claim.
10. Claim 6 recites the limitation "the center ion beam" in line 1. There is insufficient antecedent basis for this limitation in the claim.
11. Claim 10 recites the limitation "the center ion beam" in line 5. There is insufficient antecedent basis for this limitation in the claim.
12. Claims 11 and 12 depend from claim 10 and contain all of the limitations of claim 10. Therefore, claims 11 and 12 are rejected for the same reasons as claim 10.
13. Claim 12 recites the limitation "the substrate holder clamp" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

14. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

15. Claims 8 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by *Ion beam texturing* by Hudson.

16. For claim 8, Applicant requires a method for the synthesis of large area uniform cone arrays made of a first material by ion beam sputtering, wherein the first material is used as a substrate and the second material is a metal and used as a catalyst.
17. For claim 9, Applicant requires the first material to be germanium, copper, or graphite.
18. Hudson discloses texturing the surface of a first material (i.e. forming cones) comprising providing a first material of copper and a second material of molybdenum (abstract).
19. Claim 10 is rejected under 35 U.S.C. 102(b) as being anticipated by *Geometry and structure of sputter-induced cones on nickel-seeded silicon* by Fujimoto et al. (Fujimoto).
20. For claim 10, Applicant requires an apparatus for ion beam sputtering of large area uniform silicon cones comprising a high vacuum chamber, an ion source, means for holding a substrate in the chamber, means for arranging a metal catalyst around the substrate, means for adjusting the substrate temperature and means for adjusting the angles between the beam and the substrate surface normal.
21. Fujimoto discloses an apparatus for ion beam sputtering of large area silicon cones (abstract) comprising a chamber with a substrate holder (pg. 2725), an ion source (pg. 2725), means for arranging a metal catalyst around the substrate (Figure 1), temperature adjusting means (pg. 2726), and means for adjusting the angle between the beam and the substrate surface (pg. 2725).

Claim Rejections - 35 USC § 103

22. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

23. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Geometry and structure of sputter-induced cones on nickel-seeded silicon* by Fujimoto et al. (Fujimoto) in view of US 6,296,740 B1 to Xie et al. (Xie).

24. For claim 11, Applicant requires the ion source to be an RF ion source or a Kaufman ion source. Fujimoto is described above, but does not describe the ion source. Fujimoto merely uses some generic ion beam source. Therefore, the use of any compatible ion source would be obvious.

25. Xie discloses forming cones by ion beam sputtering (abstract) comprising using a Kaufman ion source (col. 3, l. 10-12) to sputter the catalyst which can be molybdenum (col. 3, l. 29-38).

26. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Fujimoto to use a Kaufman ion source because of the knowledge that Fujimoto can use any ion source and Xie teaches the a Kaufman ion source is conventionally used for forming cones with molybdenum.

Allowable Subject Matter

27. Claims 1, 3-5, and 7 are allowed.

28. Claims 2 and 6 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

29. The following is a statement of reasons for the indication of allowable subject matter: it is neither anticipated nor obvious over the prior art of record to have a method for the synthesis

of large area uniform silicon cone arrays by ion beam sputtering as claimed by Applicant in claim 1 wherein the total pressure is kept at 2×10^{-4} Torr.

30. Hudson does not disclose the pressure of the process. US 4,349,424 to Sovey et al. (Sovey) discloses an operating pressure of 4×10^{-5} Torr for a similar process (col. 3, l. 23-25), but the pressure is not the exact pressure claimed by Applicant. *High-density silicon and silicon nitride cones* by Chen et al. (Chen) discloses a process whereby the pressure is reduced below 1×10^{-4} Torr and then back filled to 10 Torr. Thus, no reference specifically teaches the exact pressure claimed by Applicant. Therefore, modifying Hudson with either Sovey or Chen would not obviate Applicant's claimed invention.

31. It is also neither anticipated nor obvious over the prior art of record to have an apparatus for ion beam sputtering as claimed by Applicant in claim 12 wherein the substrate holder clamp is made of molybdenum, tungsten, or nickel.

32. Fujimoto and Xie are described above. Neither reference discloses the substrate holder clamp to be molybdenum, tungsten, or nickel. Thus, Applicant's claimed invention is neither anticipated nor obvious.

General Information

For general status inquiries on applications not having received a first action on the merits, please contact the Technology Center 1700 receptionist at (703) 308-0661.

For inquiries involving Recovery of lost papers & cases, sending out missing papers, resetting shortened statutory periods, or for restarting the shortened statutory period for response, please contact Palestine Jenkins at (703) 308-3521.

For general inquiries such as fees, hours of operation, and employee location, please contact the Technology Center 1700 receptionist at (703) 308-0661.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H VerSteeg whose telephone number is (703) 305-4473. The examiner can normally be reached on Mon - Thurs (7:30 AM - 6:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X Nguyen can be reached on (703) 308-3322. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Steven H VerSteeg
Primary Examiner
Art Unit 1753

shv
April 24, 2003